

SG04/00325

REC'D 19 OCT 2004	
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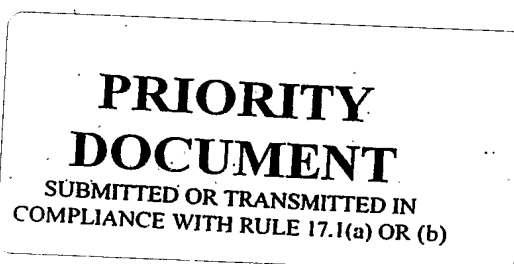
Application Number : 200307303-8

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Proprietor(s) of Patent : CHOW, Meng

Title of Invention : SYSTEM FOR GENERATING FOAM

  
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13 Oct 2004



PF1

Classification Form Index  
Date : 04-Dec-2003 10:57:43  
Normal  
Classification : Confidential  
Lodgement Date : 04-Dec-2003  
Remarks :  
ReceiptNo : 81327

General Indexes  
Your Reference : LAM/SWL/25580.1  
Title of Invention : SYSTEM FOR GENERATING FOAM

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Declaration of Priority  
Country or Country Designated :  
File number :  
Filing date :

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Applicants are inventors : Yes  
Form 8 is or will be furnished : No

Claiming an earlier filing date under  
Section :  
Patent application number :  
Filing date :  
Proceeding under :  
Date on which earlier application was amended :

Section 14 4 c Requirements  
The invention has been displayed at an international exhibition : No

Section 114 Requirements  
The invention relates to and or used a microorganism deposited for the purposes of  
disclosure in accordance with section 114 with depository authority under the Budapest Treaty : No

Checklist (A) The application consists of the following number of sheets  
Request :  
Description without Claims :  
Description with Claims : 10  
Drawings : 2  
Abstract : 1  
Total number of sheets (B) The application as filed is accompanied by : 13  
Priority documents : No  
Inventorship statement : No  
Translation of Priority Documents : No  
International Exhibition Certificate : No

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Patents Form 26 is or will be furnished  
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## SYSTEM FOR GENERATING FOAM

### FIELD OF INVENTION

- 5 This invention relates to a system for dosing a substance and creating a foam into a sanitary appliance.

### BACKGROUND OF THE INVENTION

10

It is well known to provide dispensers for releasing substances such as bleaches, cleaners or disinfectants gradually or intermittently into toilet bowls. These substances are either dispensed on its own, or dispensed together with the water when the toilet is flushed. These substances that are dispensed may be perfumed, coloured, or pre-mixed  
15 with chemical additives that inhibit staining of the toilet bowl, or to discourage microbiological growth.

20

Dispensers that are predominant in the market are the solid block types. Some of these are to be placed into the bottom of a tank of a sanitary appliance, where it would slowly dissolve and migrate into the tank water by diffusion. Similarly, another type of solid block type of dispenser is adaptable to be held near the rim of the bowl of a sanitary appliance. Mixing occurs when the toilet is flushed, and the flushing water will mix with these blocks, to create a solution that is introduced into the bowl. A known problem of these methods of dispensing are that they do not make efficient use of the chemical blocks, and most of the  
25 mixed solution is flushed away.

More recent improvements involve the isolation between the substances, and the surrounding tank water.

30

For isolated dispensers, an isolation means is used to separate the chemical solutions from the main tank of water. Generally, air-locks using the concept of U-tubes are used to create this isolation. Examples of this are found in US 4,208,747, US 4,707,865, US 4,305,162, US 4,453,278 and US 3,778,849. Other types of passive dispensers involve valves that regulate the flow of the solution in response to the water level within the tank.

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Examples of this type of dispenser are US 4,491,988 and US 4,534,071. However, as these dispensers work in response to the water level within the tank, the solution will be

dispensed regardless of whether a user wishes the solution to be dispensed. Again, this results in wastage and accelerated depletion of the solution.

5 The solution dispensed may or may not cause foam. This foam is required to abate the noise and splashes associated with the deposit of solid waste into the bowl of a sanitary system, which can be a source of embarrassment to some.

10 Foam may be created by the addition of foaming ingredients such as carbonate or bicarbonate and an acid, such as oxalic or citric acid, as well as bonding materials, for example, a gum or high viscosity methylcellulose, and foam stabilizers, for example, saponin or licorice, to the water contained in the toilet bowl. However, these additional chemicals may be hazardous to the environment, and cause potential health effects during accidental human contact.

15 It is an object of the present invention to alleviate and ameliorate the above problems.

## DESCRIPTION OF THE INVENTION

20 According to the invention, there is provided a system for generating foam in a sanitary appliance including a dosing device previously filled with a substance capable of foaming, said dosing device capable of metering a dosage of said substance, an agitation mechanism to agitate said substance to create foam, a receptacle to retain said substance for communication with said agitation mechanism, a fluid supply means to  
25 allow fluid transport of said substance to said receptacle and a triggering mechanism for activating said fluid supply means.

Preferably, said dosing device includes a container, for containing said substance.

30 Still preferably, the said dosing device further includes a positioner to maintain a position of said container, said positioner further including an opening at a bottom end of said positioner.

35 In a preferred embodiment, said positioner further includes a piercing means to extend through the opening at the bottom end of said positioner.

In another preferred embodiment, said fluid supply means further includes a first outlet and a second outlet.

5

Preferably, said first outlet is directed at said opening at a bottom end of said positioner.

Still preferably, said second outlet is directed at an inlet of said agitation mechanism.

10

In a further preferred embodiment, said agitation mechanism is a head with a plurality of spray channels.

Preferably, said agitation mechanism is positioned at an elevation to said receptacle.

15

In a preferred embodiment, the system further includes a funneled container to contain and direct said foam generated in said receptacle, directly into said sanitary appliance.

Preferably, the foam generated is directed to an overflow pipe of said sanitary.

Still preferably the foam generated is directed to the cistern of said sanitary appliance.

20

In a preferred embodiment, the triggering mechanism is a valve.

Preferably, the triggering mechanism for activating the fluid supply means is manually activated.

25

Still preferably, said manually activated triggering mechanism for activating the fluid supply means is a push valve.

30

In another preferred embodiment, said triggering mechanism for activating the fluid supply means is electronically activated.

Preferably, said electronically activated triggering mechanism for activating the fluid supply means is triggered by a detector.

35

In yet another preferred embodiment, said detector for activating the triggering mechanism is a motion detector, such that when a user is within a detectable area, the triggering mechanism will activate the system for generating foam in a sanitary appliance.

Preferably, where in use, the container for containing the substance capable of foaming is positioned in said positioner, and said piercing means on the positioner creates an aperture on said container.

5

According to another aspect of the invention, there is provided a dosing device, adaptable to be used in a system for generating foam including a container, said container previously filled with a substance capable of foaming, a positioner to position and house said container, said positioner further including a substantially vertically extending pin, said pin capable of creating an aperture at a bottom end of said container; and a fluid supply means, wherein said outlet of said fluid supply means is directed at said aperture on said bottom end of said container.

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Preferably, where in use, the container is put in said positioner and said pin creates an aperture on a bottom end of said container.

15

Thus, it can be seen that a user can easily handle the container, and when in use, an aperture can easily be created to form the dosing device.

Still preferably, said container further includes a protrusion extending from a bottom end of the container.

20

Still preferably, said aperture is on said protrusion so that fluid from the fluid supply means can easily be directed towards the aperture.

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According to yet another aspect of the invention, there is provided a container, adapted to be used in a dosing device of the present invention.

## DESCRIPTION OF FIGURES

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Embodiments of the invention will be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a view of the system for generating foam.

35

Figure 2 shows a view of the dosing device.

## DETAILED DESCRIPTION OF THE INVENTION

Reference will now be made in detail to the preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings. While the invention will be described in conjunction with the preferred embodiments, it will be understood that they are not intended to limit the invention to these embodiments. On the contrary, the invention is intended to cover alternatives, modifications and equivalents, which may be included within the spirit and scope of the invention as defined by the appended claims.

Furthermore, in the following detailed description of the present invention, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be obvious to one who is ordinarily skilled in the art that the present invention may be practiced without these specific details. In other instances, well known methods, procedures, components, and features have been described in detail as not to unnecessarily obscure aspects of the present invention.

Figure 1 shows the system for generating foam 100 according to a first aspect of the present invention. The system for generating foam 100 includes a dosing device 10 which is previously filled with a substance capable of foaming 12, an agitation mechanism 20, a receptacle 30 to retain the substance capable of foaming 12, a fluid supply means 40 to introduce a fluid to fluidly transport the dosed substance capable of foaming 12 to the receptacle 30. When retained in the receptacle 30, the agitation mechanism 20 in the form of a shower head 21 and spray channels 22 will spray fluid from the fluid supply means 40 to agitate the substance 12 admixed with a fluid to thus create a foam. This foam is then collected via a funneled container 70, and channeled directly to a cistern of the sanitary appliance 60 in a preferred embodiment of Figure 1, the foam is channeled to an overflow pipe 61 of the sanitary appliance 60.

The fluid supply means 40 is branched so that there is a first outlet 41 and a second outlet 42. The first outlet 41 and the second outlet 42 is activated by a triggering mechanism 50, such that, the fluid supply means 40 is in fluid communication with the first and second outlet. This triggering mechanism 50 is shown as a mechanical triggering mechanism, and for ease of manufacture, a push valve 51. It is to be understood that the triggering mechanism 50 can be of an electronically activated triggering mechanism, and can trigger the device when the presence of a user is detected, for example, a motion

detector. Thus, when a user is within a detectable area, the electronically activated triggering mechanism will activate the system.

5 In Figure 1, the fluid supply means is in a form of a piping system connected to a main fluid supply, and branched off to a first outlet 41 and second outlet 42. The first outlet 41 is directed to an aperture 13 of the container 11 of the dosing device 10. On fluid contact with the substance capable of foaming 12 maintained at the aperture 13 of the container 11, a small amount of the substance capable of foaming 12 is dispensed. The container 11 is previously filled with a substance capable of foaming 12 so that the interior of the container 11 is maintained at pressure as equilibrium the atmosphere pressure. Thus, the contents of the container 11, will not flow out via the aperture 13, and it is only upon the impact of the fluid from the first outlet 41 that a small amount of substance capable of foaming 12 is dispensed. It is to be appreciated that when fluid is not directed at the aperture 13 of the container 11, the substance capable of foaming 12 will be maintained within the container 11 due to the atmospheric pressure acting on the aperture 13 and towards the substance contained therein. When the triggering mechanism 50 is activated, fluid introduced by the fluid supply means 40 enters the first outlet 41 directed at the aperture 13 of the container 11. The impact of the fluid on the aperture 13, causes a small amount of the substance 12 to be dispensed. Once dispensed, the rest of the substance capable of foaming 12 contained within the container 11, will flow towards the aperture 13 by virtue of the gravitational forces.

The fluid thus admixed with the substance capable of foaming 12 will be introduced into the receptacle 30, via a connecting means 80, shown in Figure 1 as a conduit 81. The mixed substance capable of foaming 12 is made more viscous, and is retained in the receptacle 30, and the agitation mechanism 20 is allowed to agitate the mixed substance capable of foaming. In the preferred embodiment of the invention, the agitation mechanism 20 is shown as a showerhead 21, with a plurality of spray channels 22. When the triggering mechanism 50 is activated, the fluid supply means 40 is in fluid communication with the first outlet 41 and the second outlet 42. The first outlet 41 is connected to the dosing device 10, and the effect is as explained above. The second outlet 42 is connected to an agitation mechanism 20, and will activate the showerhead 21. Fluid thus exits the showerhead 21 via the plurality of spray channels 22, directed at the receptacle 30. The impact of the fluid leaving the spray channels 22 on the substance 12 contained in the receptacle 30, forms the agitation of the substance capable of foaming 12 thus creating a long lasting foam. The agitation mechanism 20 is preferably



positioned at an elevation to the receptacle 30, so that the greater impact of the fluid will cause a greater agitation. However, it is to be appreciated that the agitation mechanism 20 can equally be any device of the art that can cause vigorous movement within the receptacle 30, and will work equally well without departing from the spirit of the invention.

5

The foam thus created overflows the receptacle 30, and directly into the cistern of the sanitary appliance. In the preferred embodiment of Figure 1, the foam overflows into a funneled container 70, and then to an overflow pipe 61 of the sanitary appliance 60. Thus, it can be seen that the activation of the foam generating system is independent of the working of the sanitary appliance. This thus prevents unnecessary wastage of the substance 12. Also, a user can have a choice of whether to have foam introduced or not by activating the triggering mechanism, if necessary.

15

Figure 2 is a view of the dosing device 10, which shows how the substance capable of foaming 12 is metered due to the impact of fluid from a first outlet 41 of the fluid supply means 40. The container 11 is shown to be kept in place within a positioner 14. The positioner 14 further includes an upwardly extending pin 15, able to pierce through the bottom end of the container 11 to create an aperture 13. Thus, the container 11 can be sealed, and only when placed on the positioner 14 will the aperture 13 be created. However, it is also envisioned that the container 11 is previously provided with an aperture 13, and thus, inverted when placed within the positioner 14. To allow better wettability, it is preferred that the aperture 13 is positioned on a protruded portion 16 of the container 11. When the triggering mechanism 50 is activated, not shown in the figure, the fluid from the first outlet 41 is directed at the aperture 13, shown to be at a protruded portion 16 of the container 11. When the fluid is directed thus, the substance capable of foaming 12 near the aperture 13, is drawn out of the aperture 13 by virtue of the impact of the incoming fluid, to form a flowable substance. This flowable substance then exits the positioner 14 through the connecting means 80, shown as a conduit 81, and into the receptacle 30 for agitation and the creation of a lasting foam.

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When the triggering mechanism 20 is not activated, fluid will not be allowed to pass through the first and second outlet. Thus, the substance capable of foaming 12 is maintained within the container 11 by virtue of the equilibrium pressure maintained within the container 11.

35

**CLAIMS**

1. A system for generating foam in a sanitary appliance including  
a dosing device previously filled with a substance capable of foaming, said dosing  
5 device capable of metering a dosage of said substance;  
an agitation mechanism to agitate said substance to create foam;  
a receptacle to retain said substance for communication with said agitation  
mechanism;  
a fluid supply means to allow fluid transport of said substance to said receptacle;  
10 and  
a triggering mechanism for activating said fluid supply means.
2. A system for generating foam in a sanitary appliance according to claim 1 wherein  
said dosing device includes a container, for containing said substance.
- 15 3. A system for generating foam in a sanitary appliance according to any one of  
claims 1 or 2 wherein the said dosing device further includes a positioner to maintain a  
position of said container, said positioner further including an opening at a bottom end of  
said positioner.
- 20 4. A system for generating foam in a sanitary appliance according to claim 3 wherein  
said positioner further includes a piercing means to extend through the opening at the  
bottom end of said positioner.
- 25 5. A system for generating foam in a sanitary appliance according to claim 1 wherein  
said fluid supply means further includes a first outlet and a second outlet.
6. A system for generating foam in a sanitary appliance according to any one of  
claims 1 or 5 wherein said first outlet is directed at said opening at a bottom end of said  
30 positioner.
7. A system for generating foam in a sanitary appliance according to any one of  
claims 1 or 5 wherein said second outlet is directed at an inlet of said agitation  
mechanism.

8. A system for generating foam in a sanitary appliance according to any one of claims 1 or 7 wherein said agitation mechanism is a head with a plurality of spray channels.
- 5 9. A system for generating foam in a sanitary appliance according to any one of claims 1, 7 or 8 wherein said agitation mechanism is positioned at an elevation to said receptacle.
- 10 10. A system for generating foam in a sanitary appliance according to any one of the preceding claims wherein said system further includes a funneled container to contain and direct said foam generated in said receptacle, directly into said sanitary appliance.
11. A system for generating foam in a sanitary appliance according to claim 10, wherein the foam generated is directed to cistern of said sanitary appliance.
- 15 12. A system for generating foam in a sanitary appliance according to claim 10, wherein the foam generated is directed to an overflow pipe of said sanitary appliance.
13. A system for generating foam in a sanitary appliance according to any one of the preceding claims wherein said triggering mechanism is a valve.
- 20 14. A system for generating foam in a sanitary appliance according to any one of the preceding claims wherein said triggering mechanism for activating the fluid supply means is manually activated.
- 25 15. A system for generating foam in a sanitary appliance according to claim 14 wherein said manually activated triggering mechanism for activating the fluid supply means is a push valve.
- 30 16. A system for generating foam in a sanitary appliance according to any one of claims 1 to 11 wherein said triggering mechanism for activating the fluid supply means is electronically activated.
- 35 17. A system for generating foam in a sanitary appliance according to claim 16 wherein said electronically activated triggering mechanism for activating the fluid supply means is triggered by a detector.

18. A system for generating foam in a sanitary appliance according to claim 17 wherein said detector for activating the triggering mechanism is a motion detector.
- 5 19. A system for generating foam in a sanitary appliance according to any one of the preceding claims where in use, said container for containing the substance capable of foaming is positioned in said positioner, and said piercing means on said positioner creates an aperture on said container.
- 10 20. A dosing device, adaptable to be used in a system for generating foam according to any one of the preceding claims including
- a container, said container previously filled with a substance capable of foaming;
  - a positioner to position and house said container, said positioner further
  - 15 including a substantially vertically extending pin, said pin capable of creating an aperture at a bottom end of said container; and
  - a fluid supply means;
  - wherein said outlet of said fluid supply means is directed at said aperture on said bottom end of said container.
- 20 21. A dosing device, adaptable to be used in a system for generating foam according to claim 20 where in use, the container is put in said positioner and said pin creates an aperture on a bottom end of said container.
- 25 22. A dosing device, adaptable to be used in a system for generating foam according to any one of claims 20 or 21 wherein said container further includes a protrusion extending from a bottom end of the container.
- 30 23. A dosing device, adaptable to be used in a system for generating foam according to any one of claims 20 to 23 wherein said aperture is on said protrusion so that fluid from the fluid supply means can easily be directed at the aperture.
- 35 24. A container, adapted to be used in a dosing device according to any one of claims 20 to 23.

**SYSTEM FOR GENERATING FOAM****ABSTRACT**

- 5 A system for generating foam in a sanitary appliance including a dosing device previously filled with a substance capable of foaming, said dosing device capable of metering a dosage of said substance, an agitation mechanism to agitate said substance to create foam, a receptacle to retain said substance for communication with said agitation mechanism, a fluid supply means to allow fluid transport of said substance to said  
10 receptacle; and a triggering mechanism for activating said fluid supply means;

A dosing device, adaptable to be used in a system for generating foam according to any one of the preceding claims including a container, said container previously filled with a substance capable of foaming, a positioner to position and house said container, said  
15 positioner further including a substantially vertically extending pin, said pin capable of creating an aperture at a bottom end of said container, a fluid supply means, wherein said outlet of said fluid supply means is directed at said aperture on said bottom end of said container.

- 20 A container, adapted to be used in a dosing device according to the invention.

Figure 1

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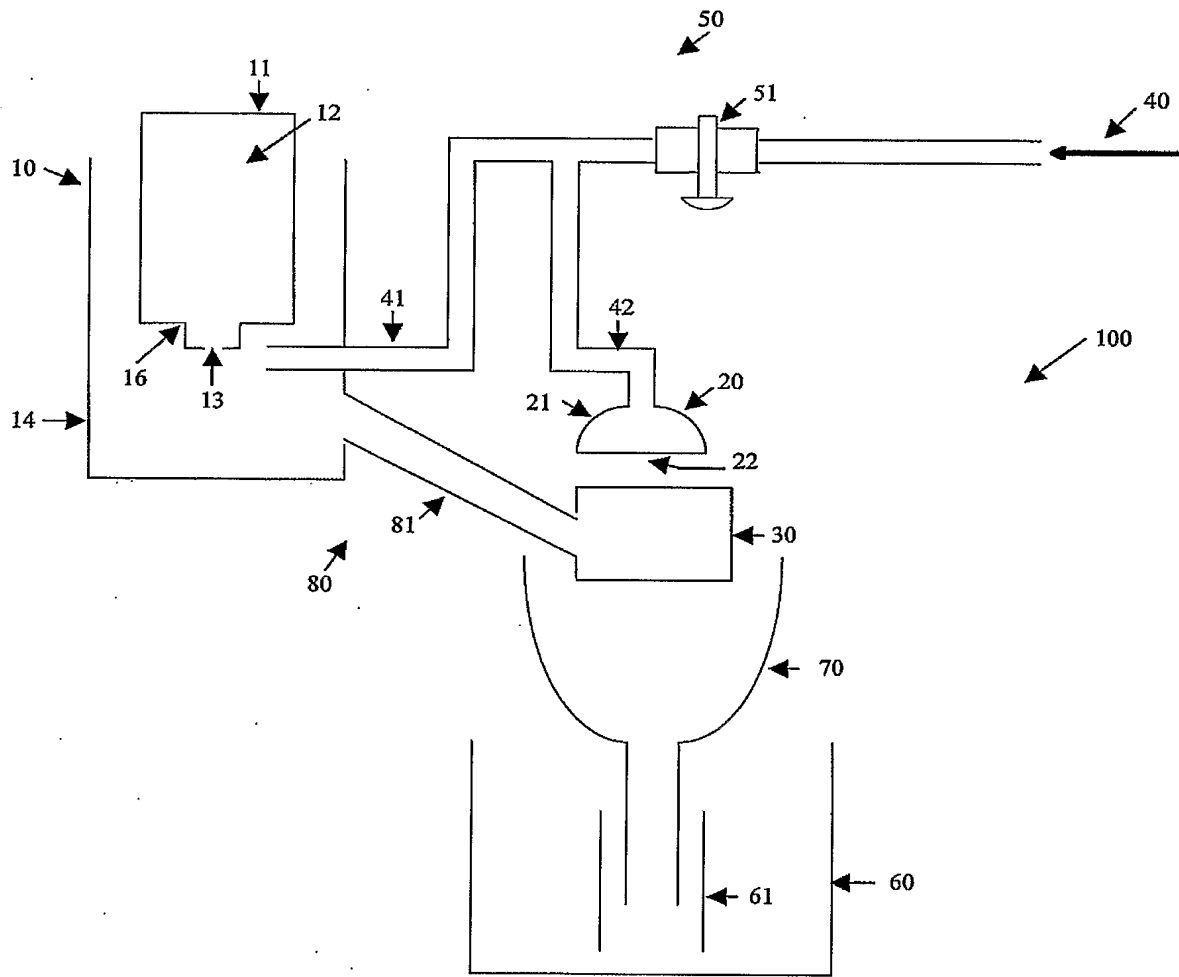


FIGURE 1

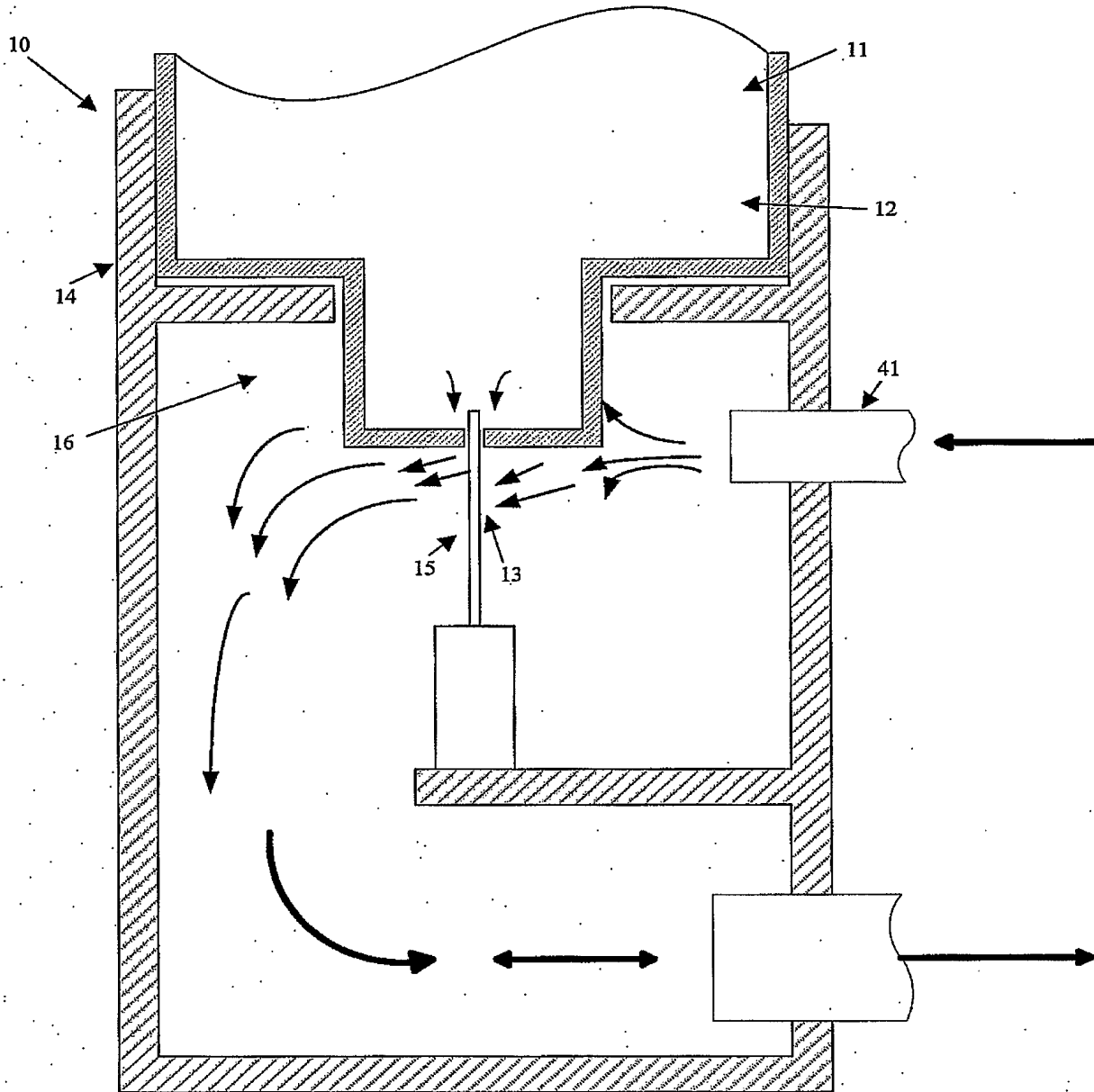


FIGURE 2